

Basic Macroeconomic Relationships

This chapter introduces you to three basic relationships in the economy: income and consumption; the interest rate and investment; and changes in spending and changes in output. The relationships between these economic "aggregates" are essential building blocks for understanding the macro models that will be presented in the next two chapters.

The first section of Chapter 27 describes the relationship between the largest aggregate in the economy—**consumption**. An explanation of consumption, however, also entails a study of saving because saving is simply the part of disposable income that is not consumed. This section develops the consumption and saving schedules and describes their main characteristics. Other key concepts are also presented: average propensities to consume (APC) and save (APS), marginal propensities to consume (MPC) and save (MPS), and the nonincome determinants of consumption and saving.

Investment is the subject of the next section of the chapter. The purchase of capital goods depends on the rate of return that business firms expect to earn from an investment and on the real rate of interest they have to pay for the use of money. Because firms are anxious to make profitable investments and to avoid unprofitable ones, they undertake all investments that have an expected rate of return greater than (or equal to) the real rate of interest and do not undertake an investment when the expected rate of return is less than the real interest rate. This relationship between the real interest rate and the level of investment spending is an inverse one: the lower the interest rate, the greater the investment spending. It is illustrated by a downsloping **investment demand curve**. As you will learn, this curve can be shifted by six factors that can change the expected rate of return on investment. You will also learn that investment, unlike consumption, is quite volatile and is the most unstable component of total spending in the economy.

The third section of the chapter introduces you to the concept of the **multiplier**. It shows how an initial change in spending for consumption or investment changes real GDP by an amount that is larger than the initial stimulus. You also will learn about the rationale for the multiplier and how to interpret it. The multiplier can be derived from the marginal propensity to consume and the marginal propensity to save. You will have learned about these marginal propensities at the beginning of the chapter and now they are put to further use as you end the chapter.

CHECKLIST

When you have studied this chapter you should be able to

- ☐ Explain how consumption and saving are related to disposable income.
- ☐ Draw a graph to illustrate the relationships among consumption, saving, and disposable income.
- ☐ Construct a hypothetical consumption schedule.
- ☐ Construct a hypothetical saving schedule, and identify the level of break-even income.
- ☐ Compute the four propensities (APC, APS, MPC, and MPS) when given the necessary data.
- ☐ State the relationship between the APC and the APS as income increases.
- ☐ Demonstrate that the MPC is the slope of the consumption schedule and the MPS is the slope of the saving schedule.
- ☐ Explain each of the four nonincome determinants of consumption and saving.
- ☐ Use a graph with real GDP on the horizontal axis to show shifts in consumption and saving schedules.
- ☐ Explain the difference between a change in the amount consumed (or saved) and a change in the consumption (or saving) schedule.
- ☐ Describe how a change in taxes shifts consumption and saving schedules.
- ☐ Explain how the expected rate of return affects investment decisions.
- ☐ Describe the influence of the real interest rate on an investment decision.
- ☐ Draw a graph of an investment demand curve for the business sector and explain what it shows.
- ☐ Explain how each of the six noninterest determinants of investment will shift the investment demand curve.
- ☐ Give four reasons why investment spending tends to be unstable.
- ☐ Define the multiplier effect in words, with a ratio, and using an equation.
- ☐ Make three clarifying points about the multiplier.
- ☐ Cite two facts on which the rationale for the multiplier is based.
- ☐ Discuss the relationship between the multiplier and the marginal propensities.
- ☐ Find the value of the multiplier when you are given the necessary data.
- ☐ Explain the significance of the multiplier.

- Discuss the reasons for the difference between the textbook example for the multiplier and the actual multiplier for the U.S. economy.
- Give a humorous example of the multiplier effect (Last Word).

■ CHAPTER OUTLINE

1. There is a positive or direct relationship between consumption and disposable income (after-tax income) because as disposable income increases so does consumption. Saving is disposable income not spent for consumer goods. Disposable income is the most important determinant of both consumption and saving. The relationship among disposable income, consumption, and saving can be shown by a graph with consumption on the vertical axis and disposable income on the horizontal axis. The **45-degree line** on the graph would show where consumption would equal disposable income. If consumption is less than disposable income, the difference is saving.

a. The **consumption schedule** shows the amounts that households plan to spend for consumer goods at various levels of income, given a price level. **Break-even income** is where consumption is equal to disposable income.

b. The **saving schedule** indicates the amounts households plan to save at different income levels, given a price level.

c. The average propensity to consume (APC) and the average propensity to save (APS) and the marginal propensity to consume (MPC) and the marginal propensity to save (MPS) can be computed from the consumption and saving schedules.

(1) The **average propensity to consume (APC)** and the **average propensity to save (APS)** are, respectively, the percentages of income spent for consumption and saved, and they sum to 1.

(2) The **marginal propensity to consume (MPC)** and the **marginal propensity to save (MPS)** are, respectively, the percentages of additional income spent for consumption and saved, and sum to 1.

(3) The MPC is the slope of the consumption schedule, and the MPS is the slope of the saving schedule when the two schedules are graphed.

d. In addition to income, there are several other important nonincome determinants of consumption and saving. Changes in *these nonincome determinants* will cause the consumption and saving schedules to change. An increase in spending will shift the consumption schedule upward and a decrease in spending will shift it downward. Similarly, an increase in saving will shift the saving schedule upward and a decrease in saving will shift it downward.

(1) The amount of wealth affects the amount that households spend and save. Wealth is the difference between the values of a household's assets and its liabilities. If household wealth increases, people will spend more because they think they have more assets from which to support current consumption possibilities (the **wealth effect**), and they will save less.

(2) The level of household **borrowing** influences consumption. Increased borrowing will increase current

consumption possibilities, which shift the consumption schedule upward. But borrowing reduces wealth increasing debt, which in turn reduces future consumption possibilities because the borrowed money must be repaid.

(3) **Expectations** about the future affect spending and saving decisions. If prices are expected to rise in the future, people will spend more today and save less.

(4) **Real interest rates** change spending and saving decisions. When real interest rates fall, households tend to consume more, borrow more, and save less.

e. Several other considerations need to be noted.

(1) Macroeconomists are more concerned with the effects of changes in consumption and saving on **GDP**, so it replaces disposable income on the horizontal axis of the consumption or saving schedules.

(2) A change in the amount consumed (or saved) is movement along the consumption (or saving) schedule, but a change in the consumption (or saving) schedule is a change in one of the nonincome determinants.

(3) Changes in wealth, borrowing, expectations, and real interest rates shift consumption and saving schedules in opposite directions. For example, an increase in wealth will increase consumption and will decrease saving as people consume more out of current income. If households borrow they can expand current consumption, but that will decrease current saving. Expectations of rising future prices will increase current consumption and decrease current saving. A fall in real interest rates increases current consumption and provides less incentive for current saving.

(4) Changes in taxes shift the consumption and saving schedules in the same direction. An increase in taxes will reduce both consumption and saving. A decrease in taxes will increase both consumption and saving.

(5) Both consumption and saving schedules tend to be stable over time unless changed by major tax increases or decreases. The stability arises from long-term planning and because some nonincome determinants shift that offset each other.

2. The investment decision is a marginal benefit–marginal cost decision that depends on the expected rate of return (r) from the purchase of additional capital goods and the real rate of interest (i) that must be paid for borrowed funds.

a. The **expected rate of return** is directly related to the net profits (revenues less operating costs) that are expected to result from an investment. It is the marginal benefit of investment for a business.

b. The **real rate of interest** is the price paid for the use of money. It is the marginal cost of investment for a business. When the expected real rate of return is greater (less) than the real rate of interest, a business will (will not) invest because the investment will be profitable (unprofitable).

c. For this reason, the lower (higher) the real rate of interest, the greater (smaller) will be the level of investment spending in the economy; the **investment**

demand curve shows this inverse relationship between the real rate of interest and the level of spending for capital goods. The amount of investment by the business sector is determined at the point where the marginal benefit of investment (i) equals the marginal cost (i).

d. There are at least six noninterest determinants of investment demand, and a change in any of these determinants will shift the investment demand curve.

(1) If the *acquisition, maintenance, and operating costs* for capital goods change, then this change in costs will change investment demand. Rising costs decrease investment demand and declining costs increase it.

(2) Changes in *business taxes* are like a change in costs so they have a similar effect on investment demand as the previous item.

(3) An *increase in technological progress* will stimulate investment and increase investment demand.

(4) The *stock of existing capital goods* will influence investment decisions. If the economy is overstocked, there will be a decrease in investment demand, and if the economy is understocked, there will be an increase in investment demand.

(5) *Planned changes in inventories* affect investment demand. If there is a planned increase in inventories, then investment demand will increase; a planned decrease in inventories will decrease investment demand.

(6) *Expectations* of the future are important. If expectations are positive because of more expected sales or profits, there is likely to be an increase in investment demand. Negative expectations will have an opposite effect on investment demand.

e. Unlike consumption and saving, investment is inherently unstable. Four factors explain this instability.

(1) *Capital goods are durable*, so when they get replaced may depend on the optimism or pessimism of business owners. If owners are more optimistic about the future they will likely spend more to obtain new capital goods.

(2) *Innovation is not regular*, which means that technological progress is highly variable and contributes to instability in investment spending decisions.

(3) *Profit expectations* influence the investment spending of businesses, but profits are highly variable.

(4) *Other expectations* concerning such factors as exchange rates, the state of the economy, and the stock market can create positive or negative expectations that change investment spending.

3. There is a direct relationship between a change in spending and a change in real GDP, assuming that prices are sticky. An initial change in spending, however, results in a change in real GDP that is greater than the initial change in spending. This outcome is called the **multiplier effect**. The **multiplier** is the ratio of the change in the real GDP to the initial change in spending. The initial change in spending typically comes from investment spending, but changes in consumption, net exports, or government spending can also have multiplier effects.

a. The multiplier effect occurs because a change in the dollars spent by one person alters the income of another person in the same direction; and because any

change in the income of one person will change the person's consumption and saving in the same direction by a fraction of the change in income. For example, assuming a marginal propensity to consume (MPC) of .75, a change in investment spending of \$5.00 will cause a change in consumption of \$3.75. The change in consumption (\$3.75) will become someone else's income in the second round. The process will continue through successive rounds, but the amount of income in each round will diminish by 25 percent because that is the amount saved from each change in income. After all rounds are completed, the initial change of \$5 in investment spending produces a total of \$20 change because the multiplier was 4 (see Table 27.3 in the text).

b. There is a formula for calculating the multiplier. The multiplier is directly related to the marginal propensity to consume (MPC) and inversely related to the marginal propensity to save (MPS). The multiplier is equal to $[1/(1 - \text{MPC})]$. It is also equal to $[1/\text{MPS}]$. The significance of the multiplier is that relatively small changes in the spending plans of business firms or households bring about large changes in the equilibrium real GDP.

c. The simple multiplier that has been described differs from the actual multiplier for the economy. In the simple case the only factor that reduced income in successive rounds was the fraction that went to savings. For the domestic economy, there are other leakages from consumption besides saving, such as spending on imports, payment of taxes, or inflation. These factors reduce the value of the multiplier. For the U.S. economy the multiplier is estimated to be about 2.

4. (Last Word) Art Buchwald once wrote a humorous story about the multiplier that illustrates the spiral effect on consumer spending from a reduction in income. A car salesman reserved a new car for a regular customer, but the customer can't buy the car because he is getting a divorce. The car salesman then tells his painter he can't afford to have his house painted. The house painter then decides to return a new television he bought from the store. And so the story continues from one person to another.

HINTS AND TIPS

1. An important graph in the chapter is the **consumption schedule** (see the Key Graph on page 544 of the text). Know how to interpret it. There are two lines on the graph. The 45-degree reference line shows all points where disposable income equals consumption (there is no saving). The consumption schedule line shows the total amount of disposable income spent on consumption at each and every income level. Where the two lines intersect, all disposable income is spent (consumed). At all income levels to the right of the intersection, the consumption line lies below the 45-degree line, and not all disposable income is spent (there is saving). To the left of the intersection, the consumption line lies above the 45-degree line and consumption exceeds disposable income (there is dissaving).

2. Always remember that **marginal propensities** sum to 1 ($\text{MPC} + \text{MPS} = 1$). The same is true for average

propensities ($APC + APS = 1$). Thus, if you know the value of one marginal propensity (e.g., MPC), you can always figure out the other (e.g., $1 - MPC = MPS$).

3. The **multiplier** effect is a key concept in this chapter and in the ones that follow, so make sure you understand how it works.

a. The multiplier is simply the ratio of the change in real GDP to the *initial* changes in spending. Multiplying the *initial* change in spending by the *multiplier* gives you the amount of change in real GDP.

b. The multiplier effect works in both positive and negative directions. An *initial* decrease in spending will result in a larger decrease in real GDP, or an *initial* increase in spending will create a larger increase in real GDP.

c. The multiplier is directly related to the marginal propensities. The multiplier equals $1/MPS$. The multiplier also equals $1/(1 - MPC)$.

d. The main reason for the multiplier effect is that the *initial* change in income (spending) induces additional rounds of income (spending) that add progressively less in each round as some of the income (spending) gets saved because of the marginal propensity to save (see Table 27.3 of the text).

■ IMPORTANT TERMS

45° (degree) line	marginal propensity to save (MPS)
consumption schedule	wealth effect
saving schedule	expected rate of return
break-even income	investment demand curve
average propensity to consume (APC)	multiplier
average propensity to save (APS)	
marginal propensity to consume (MPC)	

SELF-TEST

■ FILL-IN QUESTIONS

but at higher levels of disposable income, they tend to spend a (smaller, larger) _____ proportion of this income and save a _____ proportion. At the break-even income, consumption is (greater than, less than, equal to) _____ disposable income.

3. As disposable income falls, the average propensity to consume (APC) will (rise, fall) _____ and the average propensity to save (APS) will _____.

4. The sum of APC and APS is equal to (0, 1) _____. If the APC is .90, then the APS is (.10, 1) _____.

5. The marginal propensity to consume (MPC) is the change in (consumption, income) _____ divided by the change in _____.

6. The marginal propensity to save (MPS) is the change in (saving, income) _____ divided by the change in _____.

7. The sum of MPC and MPS is equal to (0, 1) _____. If the MPC is .75, then the MPS is (0, .25) _____.

8. The MPC is the numerical value of the slope of the (consumption, saving) _____ schedule, and the MPS is the numerical value of the slope of the _____ schedule.

9. The most important determinants of consumption spending, other than the level of income, are

- _____
- _____
- _____
- _____

10. An increase in the consumption schedule means that the consumption schedule shifts (upward, downward) _____ and a decrease in the consumption schedule means that it will shift _____, and these shifts occur because of a change in _____.

13. If the expected rate of return on an investment is greater than the real rate of interest for the use of money, a business firm will (increase, decrease) _____ its investment spending, but if the expected rate of return is less than the real rate of interest, the firm will _____ its investment spending.

14. The relationship between the real rate of interest and the total amount of investment in the economy is (direct, inverse) _____ and is shown in the investment (supply, demand) _____ curve. This curve shows that if the real rate of interest rises, the quantity of investment will (increase, decrease) _____, but if the real rate of interest falls, the quantity of investment will _____.

15. Six noninterest determinants of investment demand are

- _____
- _____
- _____
- _____
- _____
- _____

16. The demand for new capital goods tends to be unstable because of the (durability, nondurability) _____ of capital goods, the (regularity, irregularity) _____ of innovation, the (stability, variability) _____ of current and expected profits, and the _____ of expectations.

17. The multiplier is the change in real GDP (multiplied, divided) _____ by an initial change in spending.

When the initial change in spending is _____ by the multiplier, the result equals the change in real GDP.

18. The multiplier means that an increase in initial spending may create a multiple (increase, decrease) _____ in real GDP, and also that a decrease in initial spending may create a multiple _____ in real GDP.

19. The multiplier has a value equal to 1 divided by the marginal propensity to (consume, save) _____, which is the same thing as 1 divided by the quantity of 1 minus the marginal propensity to _____.

20. The higher the value of the marginal propensity to consume, the (larger, smaller) _____ the value of the multiplier, but the larger the value of the marginal propensity to save, the _____ the value of the multiplier.

TRUE-FALSE QUESTIONS

Circle T if the statement is true, F if it is false.

- Consumption equals disposable income plus saving. T F
- The most significant determinant of the level of consumer spending is disposable income. T F
- Historical data suggest that the level of consumption expenditures is directly related to the level of disposable income. T F
- Consumption rises and saving falls when disposable income increases. T F
- Empirical data suggest that households tend to spend a similar proportion of a small disposable income as they do of a larger disposable income. T F
- The break-even income is the income level at which business begins to make a profit. T F
- The average propensity to save is equal to the level of saving divided by the level of consumption. T F
- The marginal propensity to consume is the change in consumption divided by the change in income. T F
- The slope of the saving schedule is equal to the average propensity to save. T F
- An increase in wealth will increase the consumption schedule (shift the consumption curve upward). T F
- An increase in the taxes paid by consumers will decrease both the amount they spend for consumption and the amount they save. T F
- Both the consumption schedule and the saving schedule tend to be relatively stable over time. T F
- The real interest rate is the nominal interest rate minus the rate of inflation. T F
- A business firm will purchase additional capital goods if the real rate of interest it must pay exceeds the expected rate of return from the investment. T F
- An increase in the stock of capital goods on hand will decrease the investment demand. T F
- An increase in planned inventories will decrease the investment demand. T F
- Investment tends to be relatively stable over time. T F
- The irregularity of innovations and the variability of business profits contribute to the instability of investment expenditures. T F
- The multiplier is equal to the change in real GDP multiplied by the initial change in spending. T F
- The initial change in spending for the multiplier is usually associated with investment spending because of investment's volatility. T F
- The multiplier effect works only in a positive direction in changing GDP. T F

22. The multiplier is based on the idea that any change in income will cause both consumption and saving to vary in the same direction as a change in income and by a fraction of that change in income. T F

23. The higher the marginal propensity to consume, the larger the size of the multiplier. T F

24. When it is computed as $1/\text{MPS}$, the multiplier reflects only the leakage of income into saving. T F

25. The value of the actual multiplier for the economy will usually be greater than the value of a textbook multiplier because the actual multiplier is based only on the marginal propensity to save. T F

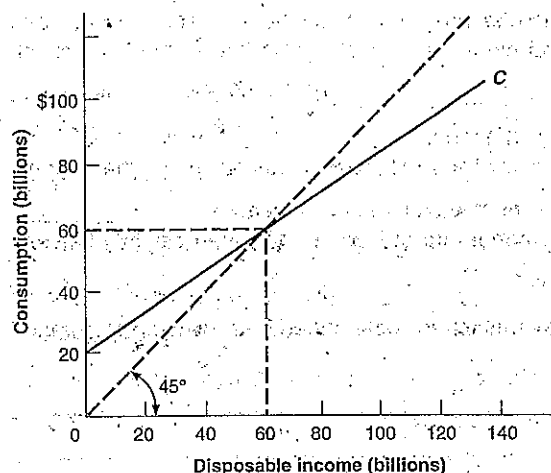
■ MULTIPLE-CHOICE QUESTIONS

Circle the letter that corresponds to the best answer.

- Saving equals
 - investment plus consumption
 - investment minus consumption
 - disposable income minus consumption
 - disposable income plus consumption
- As disposable income decreases, *ceteris paribus*,
 - both consumption and saving increase
 - consumption increases and saving decreases
 - consumption decreases and saving increases
 - both consumption and saving decrease
- Households tend to spend a larger portion of
 - a small disposable income than a large disposable income
 - a large disposable income than a small disposable income
 - their disposable income on saving when the rate of return is high
 - their saving than their disposable income when the rate of return is low
- If consumption spending increases from \$358 to \$367 billion when disposable income increases from \$412 to \$427 billion, it can be concluded that the marginal propensity to consume is
 - 0.4
 - 0.6
 - 0.8
 - 0.9
- If disposable income is \$375 billion when the average propensity to consume is 0.8, it can be concluded that
 - the marginal propensity to consume is also 0.8
 - the marginal propensity to save is 0.2
 - consumption is \$325 billion
 - saving is \$75 billion
- As the disposable income of the economy increases
 - both the APC and the APS rise
 - the APC rises and the APS falls
 - the APC falls and the APS rises
 - both the APC and the APS fall
- The slope of the consumption schedule or line for a

- marginal propensity to consume
- average propensity to consume
- marginal propensity to save
- average propensity to save

Answer Questions 8 and 9 on the basis of the following graph.



- This graph indicates that
 - consumption decreases after the \$60 billion level of disposable income
 - the marginal propensity to consume decreases after the \$60 billion level of disposable income
 - consumption decreases as a percentage of disposable income as disposable income increases
 - consumption increases as disposable income decreases
- If the relevant saving schedule were constructed, would find that
 - the marginal propensity to save is negative at the \$60 billion level of disposable income
 - the marginal propensity to save increases after \$60 billion level of disposable income
 - saving is zero at the \$60 billion level of disposable income
 - saving is \$20 billion at the \$0 level of disposable income

Answer Questions 10, 11, and 12 on the basis of the following disposable income (DI) and consumption (C) schedules for a private, closed economy. All figures are in billions of dollars.

DI	C
\$0	\$4
40	40
80	76
120	112
160	148
200	184

- If plotted on a graph, the slope of the consumption schedule would be

- (b) 0.7
(c) 0.8
(d) 0.9
11. At the \$160 billion level of disposable income, the average propensity to save is
(a) 0.015
(b) 0.075
(c) 0.335
(d) 0.925
12. If consumption increases by \$5 billion at each level of disposable income, then the marginal propensity to consume will
(a) change, but the average propensity to consume will not change
(b) change, and the average propensity to consume will change
(c) not change, but the average propensity to consume will change
(d) not change, and the average propensity to consume will not change
13. If the slope of a linear saving schedule decreases, then it can be concluded that the
(a) MPS has decreased
(b) MPC has decreased
(c) income has decreased
(d) income has increased
14. An increase in wealth shifts the consumption schedule
(a) downward and the saving schedule upward
(b) upward and the saving schedule downward
(c) downward and the saving schedule downward
(d) upward and the saving schedule upward
15. Expectations of a recession are likely to lead households to
(a) increase consumption and saving
(b) decrease consumption and saving
(c) decrease consumption and increase saving
(d) increase consumption and decrease saving
16. Higher real interest rates are likely to
(a) increase consumption and saving
(b) decrease consumption and saving
(c) decrease consumption and increase saving
(d) increase consumption and decrease saving
17. An increase in taxes shifts the consumption schedule
(a) downward and the saving schedule upward
(b) upward and the saving schedule downward
(c) downward and the saving schedule downward
(d) upward and the saving schedule upward
18. Which relationship is an inverse one?
(a) consumption and disposable income
(b) investment spending and the rate of interest
(c) saving and disposable income
(d) investment spending and GDP
19. A decrease in investment demand would be a consequence of a decline in
(a) the rate of interest
(b) the level of wages paid
(c) business taxes
(d) expected future sales
20. Which would increase investment demand?
(a) an increase in business taxes
(b) an increase in planned inventories
(c) a decrease in the rate of technological change
(d) an increase in the cost of acquiring capital goods
21. Which best explains the variability of investment?
(a) the predictable useful life of capital goods
(b) constancy or regularities in business innovations
(c) instabilities in the level of profits
(d) business pessimism about the future
22. If there was a change in investment spending of \$10 and the marginal propensity to save was .25, then real GDP would increase by
(a) \$10
(b) \$20
(c) \$25
(d) \$40
23. If the value of the marginal propensity to consume is 0.6 and real GDP falls by \$25, this was caused by a decrease in initial spending of
(a) \$10.00
(b) \$15.00
(c) \$16.67
(d) \$20.00
24. If the marginal propensity to consume is 0.67 and initial spending increases by \$25, real GDP will
(a) increase by \$75
(b) decrease by \$75
(c) increase by \$25
(d) decrease by \$25
25. If in an economy a \$150 billion increase in investment spending creates \$150 billion of new income in the first round of the multiplier process and \$105 billion in the second round, the multiplier and the marginal propensity to consume will be, respectively,
(a) 5.00 and 0.80
(b) 4.00 and 0.75
(c) 3.33 and 0.70
(d) 2.50 and 0.40

PROBLEMS

1. The following table is a consumption schedule. Assume taxes and transfer payments are zero and that all saving is personal saving.

(GDP = DI)	C	S	APC	APS
1500	\$1540	\$	1.027	-.027
1600	1620		1.013	-.013
1700	1700			
1800	1780		.989	.011
1900	1860		.979	.021
2000	1940			
2100	2020		.962	.038
2200	2100			

- a. Compute saving at each of the eight levels of disposable income and the missing average propensities to consume and to save.

b. The break-even level of disposable income is \$_____.

c. As disposable income rises, the marginal propensity to consume remains constant. Between each two GDPs the MPC can be found by dividing \$_____ by \$_____, and is equal to _____.

d. The marginal propensity to save also remains constant when the GDP rises. Between each two GDPs the MPS is equal to \$_____ divided by \$_____, or to _____.

e. Plot the consumption schedule, the saving schedule, and the 45-degree line on the graph below.

(1) The numerical value of the slope of the consumption schedule is _____, and the term that is used to describe it is the _____.

(2) If the relevant saving schedule were constructed, the numerical value of the slope of the saving schedule would be _____, and the term that is used to describe it would be the _____.

2. Indicate in the space to the right of each of the following events whether the event will tend to increase (+) or decrease (-) the saving schedule.

- Development of consumer expectations that prices will be higher in the future _____
- Gradual shrinkage in the quantity of real assets owned by consumers _____

c. Increase in household borrowing _____

d. Growing belief that disposable income will be lower in the future _____

e. Expectations that there will be a current shortage of consumer goods _____

f. Rise in the actual level of disposable income _____

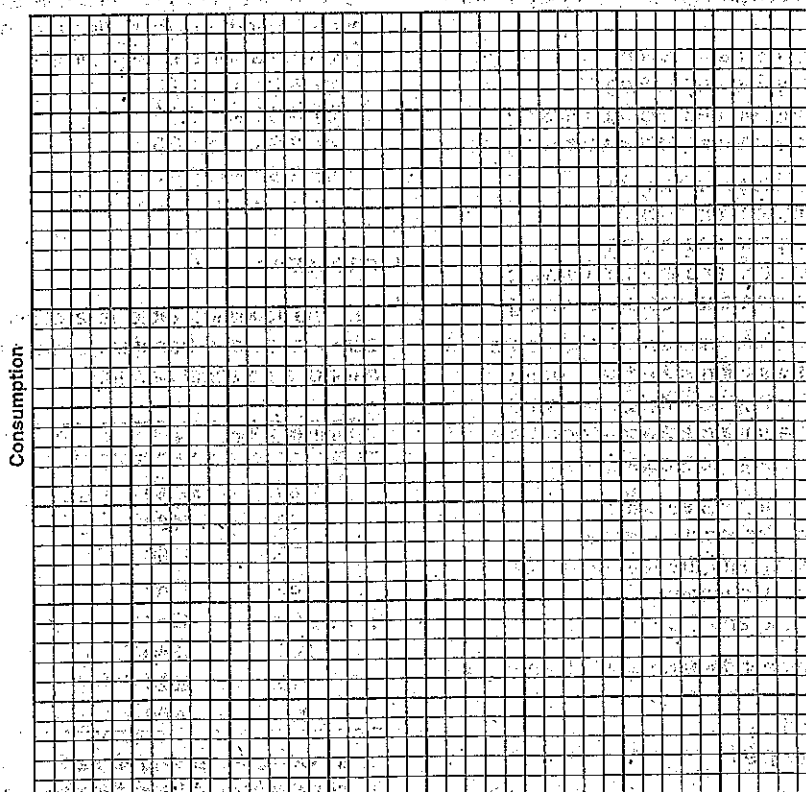
g. An increase in household wealth _____

h. Development of a belief by consumers that Federal government can and will prevent recession in the future _____

3. The following schedule has eight different expected rates of return, and the dollar amounts of the investment projects expected to have each of these return rates:

Expected rate of return	Investment projects (billions)
18%	\$ 0
16	10
14	20
12	30
10	40
8	50
6	60
4	70

a. If the real rate of interest in the economy were _____, business firms would plan to spend \$_____.



billion for investment, but if the real interest rate were 16%, they would plan to spend \$_____ for investment.

b. Should the real interest rate be 14%, and they would still wish to make the investments they were willing to make at real interest rates of 18% and 16%, they would plan to spend an additional \$_____ billion for investment, and their total investment would be \$_____ billion.

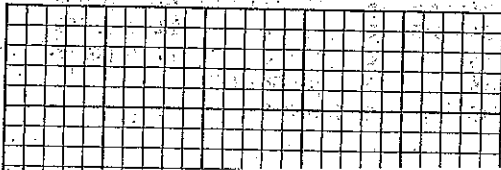
c. If the real rate of interest were 12%, they would make all the investments they had planned to make at higher real interest rates plus an additional \$_____ billion, and their total investment spending would be \$_____ billion.

d. Complete the following table by computing the amount of planned investment at the four remaining real interest rates.

Real rate of interest	Amount of investment (billions)
18%	\$ 0
16	10
14	20
12	60
10	_____
8	_____
6	_____
4	_____

e. Graph the schedule you completed on the graph below. Plot the real rate of interest on the vertical axis and the amount of investment planned at each real rate of interest on the horizontal axis.

f. Both the graph and the table show that the relationship between the real rate of interest and the amount of investment spending in the economy is _____. This means that when the real rate of interest (1) increases, investment will (increase, decrease) _____.



- (2) decreases, investment will _____.
g. It also means that should we wish to
(1) increase investment, we would need to _____ the real rate of interest.

(2) decrease investment, we would have to _____ the real rate of interest.

h. This graph (or table) is the _____ curve.

4. Indicate in the spaces to the right of the following events whether the event would tend to increase (+) or decrease (–) investment spending.

- a. Rising stock market prices _____
b. Development of expectations by business executives that business taxes will be higher in the future _____

c. Step-up in the rates at which new products and new production processes are being introduced _____

d. Business beliefs that wage rates may be lower in the future and labor and capital are complementary resources _____

e. An expectation of a recession _____

f. A belief that business is "too good" and the economy is due for a period of "slow" consumer demand _____

g. Rising costs in the construction industry _____

h. A rapid increase in the size of the economy's population _____

i. A recent period of a high level of investment spending, which has resulted in productive capacity in excess of the current demand for goods and services _____

5. Assume the marginal propensity to consume is 0.8 and the change in investment is \$10. Complete the following table modeled after Table 27.3 in the textbook.

	Change in income	Change in consumption	Change in saving
Increase in gross investment of \$10	\$ + 10	\$ _____	\$ _____
Second round	_____	_____	_____
Third round	_____	_____	_____

2. Use a graph to illustrate the historical relationship between consumption and disposable income in the U.S. economy. Explain why the slope of the consumption line will be less than the 45-degree reference line.
3. Describe the relationship between consumption and disposable income, called the consumption schedule. Draw a graph of this schedule.
4. Describe the relationship between saving and disposable income, called the saving schedule. Draw a graph of this schedule.
5. Define the two average propensities and the two marginal propensities.
6. Explain briefly how the average propensity to consume and the average propensity to save vary as disposable income varies. Why do APC and APS behave this way? What happens to consumption and saving as disposable income varies?
7. Why do the sum of the APC and the APS and the sum of the MPC and the MPS always equal exactly 1?
8. What is the relationship between MPC and MPS and the slopes of the consumption schedule and saving schedule?
9. Explain briefly and explicitly *how* changes in the four nonincome determinants will affect the consumption schedule and the saving schedule and *why* such changes will affect consumption and saving in the way you have indicated.
10. Why does taxation shift both the consumption and saving schedules in the same direction?
11. What is the difference between a change in the amount consumed and a change in the consumption schedule? Explain your answer using a graph.
12. Are consumption and saving schedules relatively stable? Explain.
13. Discuss the marginal cost and marginal benefit of an investment decision. How are the marginal cost and the marginal benefit of investment measured?
14. Draw an investment demand curve. Use it to explain why investment spending tends to rise when the real rate of interest falls, and vice versa.
15. Identify and explain how six noninterest determinants of investment spending can increase or decrease the amount of investment. Illustrate the changes with a graph.
16. Why does the level of investment spending tend to be highly unstable? State four reasons.
17. What is the multiplier effect? Give an equation and example to show how it works.
18. State the rationale for the multiplier effect.
19. How is the multiplier effect related to the marginal propensities? Explain in words and equations.

20. How large is the actual multiplier effect? Explain the reasons for the difference between the textbook example of the multiplier and actual multiplier for the economy.

ANSWERS

Chapter 27 Basic Macroeconomic Relationships

FILL-IN QUESTIONS

1. consume, save
2. directly, larger, smaller, smaller, larger, equal to
3. rise, fall
4. 1, .10
5. consumption, income
6. saving, income
7. 1, .25
8. consumption, saving
9. a. wealth; b. borrowing; c. expectations; d. real interest rate; (any order for a-d)
10. upward, downward, income
11. return, interest
12. benefit, cost
13. increase, decrease
14. inverse, demand, decrease, increase
15. a. the cost of acquiring, maintaining, and operating capital goods; b. business taxes; c. technological change; d. the stock of capital goods on hand; e. planned changes in inventories; f. expectations
16. durability, irregularity, variability, variability
17. divided, multiplied
18. increase, decrease
19. save, consume
20. larger, smaller

TRUE-FALSE QUESTIONS

- | | | |
|-------------------|--------------------|---------------------|
| 1. F, p. 542 | 10. T, p. 546 | 19. F, p. 554 |
| 2. T, p. 542 | 11. T, p. 548 | 20. T, p. 554 |
| 3. T, p. 542 | 12. T, p. 548 | 21. F, pp. 554-555 |
| 4. F, pp. 543-544 | 13. T, p. 549 | 22. T, pp. 554-555 |
| 5. F, pp. 543-544 | 14. F, pp. 549-551 | 23. T, p. 556 |
| 6. F, pp. 543-545 | 15. T, p. 552 | 24. T, p. 556 |
| 7. F, p. 545 | 16. F, p. 552 | 25. F, pp. 556, 558 |
| 8. T, p. 545 | 17. F, pp. 552-553 | |
| 9. F, p. 546 | 18. T, p. 553 | |

MULTIPLE-CHOICE QUESTIONS

- | | | |
|-------------------|--------------------|--------------------|
| 1. c, p. 542 | 10. d, p. 546 | 19. d, p. 552 |
| 2. d, pp. 542-543 | 11. b, p. 545 | 20. b, p. 552 |
| 3. a, pp. 542-543 | 12. c, p. 545 | 21. c, pp. 553-554 |
| 4. b, p. 545 | 13. a, p. 546 | 22. d, pp. 554-556 |
| 5. d, p. 545 | 14. b, p. 546 | 23. a, pp. 554-556 |
| 6. c, p. 545 | 15. c, p. 547 | 24. a, pp. 554-556 |
| 7. a, p. 546 | 16. c, p. 47 | 25. c, pp. 554-556 |
| 8. c, pp. 542-543 | 17. c, p. 548 | |
| 9. c, pp. 542-543 | 18. b, pp. 549-550 | |

PROBLEMS

1. a. S: -40, -20, 0, 20, 40, 60, 80, 100; APC: 1.000, 0.970, 0.955; APS: 0.000, 0.030, 0.045; b. 1700; c. 80, 100, .8; d. 20, 100, .20; e. (1) .8, MPC, (2) .2, MPS
2. a. -; b. +; c. -; d. +; e. -; f. none; g. -; h. -
3. a. 0, 10; b. 20, 30; c. 30, 60; d. 100, 150, 210, 280; f. inverse, (1) decrease, (2) increase; g. (1) lower, (2) raise; h. investment-demand
4. a. +; b. -; c. +; d. +; e. -; f. -; g. -; h. +; i. -
5. Change in income: 8.00, 6.40, 5.12, 4.10, 50; Change in consumption: 8.00, 6.40, 5.12, 4.10, 3.28, 40.00; Change in saving: 2.00, 1.60, 1.28, 1.02, 0.82, 10.00

SHORT ANSWER AND ESSAY QUESTIONS

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|----------------|-----------------|------------------|
| 1. p. 542 | 8. p. 546 | 15. pp. 551-552 |
| 2. pp. 542-543 | 9. pp. 546-547 | 16. pp. 552-554 |
| 3. pp. 543-544 | 10. p. 548 | 17. p. 554 |
| 4. pp. 543-544 | 11. pp. 547-548 | 18. pp. 554-555 |
| 5. p. 545 | 12. p. 548 | 19. p. 556 |
| 6. p. 545 | 13. pp. 549-551 | 20. pp. 556, 558 |
| 7. p. 545 | 14. pp. 549-551 | |